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PROBLEMS OF AIR AND WATER CONTAMINATION
IN CZECHOSLOVAKIA

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There is not a foreigner who, having seen our country, is not impressed by its beauties shaped by agreeable natural conditions and the creative work of many generations of human hands, brains, and hearts.

The extensive construction of new mines, power stations, chemical and metallurgical works, machine-building and other industrial plants; the closely related construction of residential areas and communications; the reorganization of farming; and the reconstruction and expansion of present establishments must necessarily produce certain undesirable phenomena whose further growth could unfavorably affect the conditions of life of people, animals, and vegetables, and spoil the scenery and natural attractions. A favorable life and work environment, however, is a condition of the over-all standard of a socialist society and is therefore an object of our care.

The problem of devastation of nature and of air contamination is a problem of all developed countries.

In every industrial area and far beyond its limits, rivers become gutters full of dirt of all kind; forests which are the chief supplier and storehouse of water give way to residential districts, communications, and industrial installations, and are turned into farm land. Even the total area of farm land in industrial countries is diminishing as a consequence of investment activity, and only through an increase of the average product and large-scale cultivation measures can the earth supply enough food for its growing population.

A special problem of the industrial and civilization process in developed countries is the contamination of air by dust, smoke, floating ashes, and various chemical products which are undesirable by-products of industrial activity, the production of power, etc. Contaminated air renders difficult, or even endangers, the life of human beings, animals and vegetables, as may be easily evidenced without special scientific evidence, e.g., in the Erz Mountains (Krusne hory); the forest vegetation, and forest and field animals--if there are any still alive--speak for themselves.

The contamination of air is caused by industrial establishments equipped with steam engines, powder-producing industry (e.g., cement-works), residences with local heating, railroads, automobiles, etc. One

of the greatest factors of air contamination everywhere are the power and thermal stations which burn in their furnaces large amounts of low-quality coal with a high percentage of ashes.

The quantity of soot, dust, and ashes which are in the contaminated air and fall down to the earth is unbelievably large and grows from year to year as a result of the development of industry and communications. So, for instance, the deposit of dirt on one square kilometer of the area of Greater Prague totaled in 1939 approximately 90 metric tons, in 1949 about 200 tons, and at present about 500 tons; in the whole industrial area of Liben and Vysocany it averages 2000 tons a year. On the area of Velka Ostrava, the surface of 126 km^2 was covered in 1956 by 888 tons per km^2 and in 1958 by 1150 tons per km^2 . The worst contaminated area is that of Northwestern Bohemia, in the vicinity of the large power stations (Komorany, Trebusice) where the average annual deposit is 1467-4100 tons per km^2 . For that reason one of the tasks of the Third Five-Year Plan is to secure in this area a healthful and hygienically perfect atmosphere and to liquidate air contamination.

In addition to dust, soot and ashes the air contains also chemical by-products obtained by combustion of coal and by-products of various--especially chemical--production processes; above all sulfur dioxide, chlorine, hydrogen sulfide and other gases. The industry, mining and communications do not spoil only the air but the landscape as well. We have already mentioned the vast deposits of refuse in surface excavating of coal, the large extent of such mines, the huge piles of rubble extracted from underground mines, etc. Even storing of slag and ashes, the waste of metallurgical and other industrial plants, and power stations, presents a big problem. In steam power stations with a great output, as many as 5000 tons of slag and ashes are accumulated in a day. To store such a quantity of material requires a large area of land which could be otherwise used for farming or other useful purposes, and the piles moreover disfigure the landscape.

The contamination of our water courses and lakes reaches more than a critical condition. The water is polluted by refuse from cities and residential areas where the restoration of its original qualities does not present any difficulties. The program of the Third Five-Year Plan includes a substantially higher amount (than that available at present) for construction of 200 purifying stations. Another problem, namely the restoration of water adulterated by substances (e.g., phenol) which can be removed only after overcoming serious technical difficulties, involves considerable outlays. The polluted water takes away even valuable industrial materials; e.g., in the paper mills at Steti at least 50 tons of cellulose was carried away in a day. A practical technical device put an end to this waste of material. The construction cost of water purifying stations processing water polluted by industrial establishments amounts to almost 1.5 billion Kcs.

The increasing water and air contamination, the gradual devastation of nature and the consequences of these factors on the life of society compels industrial states to resist these undesirable phenomena by various legal acts.

In the Soviet Union, for instance, there have been introduced standards for the maximum concentration of harmful elements in the atmosphere which must be observed by each newly built plant. The international importance of this problem made it necessary to call a world conference in London dealing with the contamination of air. The conference was attended by 1200 delegates from 30 countries, which by itself proves the remarkable interest which this problem stirred up.

Even this country gives growing attention to this question. Preliminary steps were taken when various legal decrees and regulations were issued. Altogether, there are some 30 regulations, valid for the whole territory of the state, which relate to the purity of water, air and nature. Certain measures aimed at relieving the negative consequences of the developing industry and mining for farming, forestry and fishery, for health and other politico-economic interests are included in the government resolutions. All these decrees, however, are only partial, lacking interrelation, and do not solve the problems as an important whole which is in close relation to all questions of our construction efforts.

The growing extent of nature devastation and water and air contamination, proportionate to the growing volume of our construction compels us, however, to solve more methodically, purposefully--with regard to the whole complex of problems engaging various branches of science and technology--the questions concerning the recovery and beautification of the environment in which we live. Quite recently, a great deal has been done and a great deal is in preparation to achieve this goal.

The basic document in this section of our economic and cultural development is the Resolution of the Central Committee of the Communist Party of Czechoslovakia embodied in State Resolution No 177 of March 1959, relating to improvement of life and work environment. A definite and consistent improvement of environment and landscape is such a serious problem that the Czechoslovak Academy of Sciences included it in the plan for fundamental scientific research in the Third Five-Year Plan. This also accounts for the foundation of the Commission of the CSAV (Ceskoslovenska Akademie Ved - Czechoslovak Academy of Sciences) for working out basic prospective measures for an effective solution of air contamination in industrial areas of the CSSR, which consists of representatives of scientific institutes, departments, hygienic and medical organs, kraj national assemblies, etc. In agreement with the Czechoslovak Academy of Agricultural Sciences, establishment of a research institute for protection and preservation of nature is being prepared.

A law protecting living environment is being prepared. Even certain organizational measures within the administration are aimed at providing the Government with more power and influence in coordination of the partial decisions and control of fulfilling the specific tasks in this field. Within the wide scope of these efforts Law No 101 of 11 July 1960 is the first important result. The increasing importance of fishing and the close relation between a planned use of water

resources for farming and satisfaction of the constantly growing demands of the population caused that the administration of water resources was concentrated in the Ministry of Agriculture, Forestry and Fisheries; thereby this ministry becomes a very important factor in shaping the nature and protecting living environment.

Kraj hygienico-epidemiological stations and agricultural and construction sections of the kraj national assemblies, which are especially concerned with these problems are methodically collecting data on the sources and consequences of devastation and pollution of their areas and suggest and execute various amendments. A quite significant part in this project is also played by the Institute of Regional Planning which processes the problems of development of the individual krajs and areas with regard to removal of the consequences of industrialization and to obtaining optimum health and appearance conditions in further development.

Another institute which actively participates in the efforts for a methodical solution of the problem of nature and air pollution is the Czechoslovak Scientific-Technical Society (Cs.VTS). After several actions of secondary character and importance, the Ostrava Kraj section of the Cs.VTS in cooperation with the former Ministry of Energy and Water Resources and with an effective organizational assistance of ORGREZ (Organizacia pre racionálizáciu energetickych zariadení--Organization for Rationalization of Power-Producing Equipment) held in May 1960 in Brno, a national conference dealing with reduction of dust in the processes characteristic of the steam power stations, which are the largest source of floating ashes and chemical by-products of coal. The resolution drawn-up at the conference stated that the fight for reduction of dust production in power stations and for the industrial utilization of the refuse which defaces wide neighborhood of the power stations has to be conducted in three ways: by intercepting a maximum amount of the floating ashes and other by-products; by providing for the transportation, storage, and industrial utilization of the amassed ashes; and by applying the control (measuring) of the percentage of ashes within the limits established by the standards.

The recently announced Government action on the cleanliness of air was taken under the decree of 21 October 1960 on using material sanctions when excessive contamination of air is observed. The care of nature will be, above all, placed in charge of the national assemblies.

The construction of an industrialized land, a favorable living environment, and the safeguarding of cleanliness of the landscape and air are very significant tasks for a further development of the creative powers of the working people and for their joyful and happy life. They are tasks whose solution is by no means simple. There are but a few tasks of this kind in the solution of which all sectors of science, technology and practice had to participate. There is no branch of technology which could not bring in a share of its research and work in the solution of this problem.